REMARKS

Claims 1-51 have been rejected. Claims 1, 25 and 47 have been amended and claims 3, 4, 27 and 28 have been canceled solely to further the prosecution of the application. Applicant reserves the right to claim the subject matter of pre-amended claims 1, 25 and 47 and canceled claims 3, 4, 27 and 28 in this or any other application.

Claims 1-6, 12-15, 17, 18, 20-22, 25-30, 36-38, 40, 41 and 44 stand rejected under 35 U.S.C. § 102(b) as being anticipated by von Windheim. Claims 3, 4, 27 and 28 have been canceled, thus rendering this rejection moot as to those claims. Claims 1 and 25 have been amended. Applicant respectfully traverses this rejection.

Claims 1 and 25 are each directed to a gas sensor device that, among other features, includes being "selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device". Claims 2, 5, 6, 12-15, 17, 18 and 20-22 depend from claim 1, while claims 26, 29, 30, 36-38, 40, 41 and 44 depend from claim 25.

The von Windheim reference refers only to diamond Schottky diodes and gas sensors fabricated therefrom. A review of von Windheim confirms that the only type of gas sensor described therein is a Schottky diode-based gas sensor. See, for example, Column 2, lines 32-33 ("It is therefore an object of the invention to provide a diamond Schottky diode").

Schottky diodes are neither HFETs, MISFETs, MESFETs, MISHFETs, capacitors, resistors, or diodes formed from layers of different dopings in a semiconductor device and thus von Windheim fails to teach each and every element as recited in claims 1 and 25. Schottky diodes are vastly different from HFETs, MISFETs, MESFETs, MISHFETs, capacitors, resistors, or diodes formed from layers of different dopings in a semiconductor device. For example, a FET is controlled by a gate that is independent of conduction. A Schottky diode, to the contrary, is controlled by a gate which is inherently a part of the conduction process. At high temperatures, the conducting of a

current through a Schottky diode device will cause the device to suffer degradation of the conduction path. Further, Schottky diodes are vastly different devices than capacitors, resistors, or diodes formed from layers of different dopings in a semiconductor device. Applicant respectfully submits that von Windheim fails to teach or suggest each and every feature recited in claims 1 and 25, and therefore, claims 1, 2, 5, 6, 12-15, 17, 18, 20-22, 25, 26, 29, 30, 36-38, 40, 41 and 44 cannot be anticipated by this reference.

Claims 1-6, 13-15, 17, 20-22, 48 and 49 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Baranzahi. Claims 3 and 4 have been canceled, thus rendering this rejection moot as to that claim. Claim 1 has been amended. Applicant respectfully traverses this rejection.

As noted previously, claim 1 recites a gas sensor device having several features, some of which are "a semiconductor layer having a surface", "one or more catalytic gate-electrodes deposited on said surface" and "one or more ohmic contacts deposited on said surface". Claims 2, 5, 6, 13-15, 17 and 20-22 depend from claim 1. Claim 48 recites a gas sensor device that includes, among other features, "a semiconductor substrate having a surface" and "one or more ohmic contacts deposited on a surface of said semiconductor substrate". Claim 49 depends from claim 48.

Baranzahi refers to a gas sensing device that includes a semiconductor 1, an insulator 2, a catalytic metal 3, an intermediate layer 4, and a catalytic layer 5. It is unclear from Baranzahi whether the catalytic metal 3 serves as a catalytic gate-electrode or as an ohmic contact, and it is equally unclear whether the catalytic layer 5 serves as a catalytic gate-electrode or an ohmic contact. What is abundantly clear, however, is that neither the catalytic metal 3 nor the catalytic layer 5 is deposited on a surface of the semiconductor. Therefore, Baranzahi fails to teach or suggest each and every element of claim 1 in that it fails to teach "one or more catalytic gate-electrodes deposited on [a semiconductor layer] surface" and fails to teach or suggest each and every element of claims 1 and 48 in that it fails to teach "one or more ohmic contacts deposited on [a semiconductor layer] surface".

Claims 7-10 and 31-34 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of von Windheim and Sibbald. Claims 7-10 depend from claim 1, while claims 31-34 depend from claim 25. Applicant respectfully traverses this rejection.

As noted previously, von Windheim fails to teach or suggest a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device" as recited in claims 1 and 25. Sibbald is relied upon in the Office action as teaching the use of osmium, platinum/rhodium, vanadium oxide, or mixtures thereof as a catalytically active metal. Sibbald provides no relevant teaching or suggestion regarding a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device".

Claims 11 and 35 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of von Windheim and Onaga. Claim 11 depends from claim 1, while claim 35 depends from claim 25. Applicant respectfully traverses this rejection.

The von Windheim reference, as noted previously, fails to teach or suggest a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device" as recited in claims 1 and 25. Onaga is relied upon in the Office action as teaching the use of $LaNiO_3$ as a metal oxide semiconductor. Onaga provides no relevant teaching or suggestion regarding a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device".

Claims 19, 42 and 47 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of von Windheim and Najafi. Claim 19 depends from claim 1, claim 42 depends from claim 25, and claim 47 is independent in nature. Claim 47 has been amended and recites, in relevant part, a gas sensor device that is "selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device". Applicant respectfully traverses this rejection.

The von Windheim reference, as noted previously, fails to teach or suggest a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device" as recited in claims 1, 25 and 47. Najafi is relied upon in the Office action as teaching a flip-chip design for gas microsensors. Najafi provides no relevant teaching or suggestion regarding a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device".

Claim 23 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of von Windheim and Kang. Claim 23 depends from claim 1. Applicant respectfully traverses this rejection.

The von Windheim reference, as noted previously, fails to teach or suggest a "gas sensor device ... selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device" as recited in claim 1. Kang is relied upon in the Office action as teaching a FET sensor array. Due to the vast difference between Schottky diodes and FET sensor devices, capacitors, resistors, and diodes formed from layers of different dopings in a semiconductor device, there would have been no suggestion or motivation to one ordinarily skilled in the art to combine the teachings of von Windheim with those of Kang.

Claims 16 and 51 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Baranzahi and Khan. Claim 16 depends from claim 1 and claim 51 is independent in nature. Claim 51 recites a gas sensor device that includes, among other features, "a semiconductor substrate having ... a surface", "one or more catalytic gate-electrodes deposited on said surface", and "one or more ohmic contacts deposited on said surface". Applicant respectfully traverses this rejection.

Baranzahi fails to teach or suggest both "one or more catalytic gate-electrodes deposited on [a semiconductor] surface" and "one or more ohmic contacts deposited on [a

semiconductor layer] surface" as recited in claims 1 and 51. Khan is relied upon in the Office action as teaching the use of a heterostructure AlGaN layer, and thus, provides no relevant teaching or suggestion pertaining to "one or more catalytic gate-electrodes deposited on [a semiconductor] surface" and "one or more ohmic contacts deposited on [a semiconductor layer] surface".

Claims 25-30, 41, 43 and 46 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Baranzahi and von Windheim. Claims 26-30, 41, 43 and 46 depend from claim 25. Applicant respectfully traverses this rejection.

As noted previously, Baranzahi fails to teach or suggest "one or more catalytic gate-electrodes deposited on [a semiconductor] surface" and "one or more ohmic contacts deposited on [a semiconductor layer] surface" as recited in claim 25. Further, von Windheim fails to teach or suggest a gas sensor "selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device" as recited in claim 25. Further, since the focus of von Windheim is Schottky diodes, there would have been no motivation or suggestion to combine the teachings of von Windheim with Baranzahi.

Claim 39 stands rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Baranzahi, von Windheim and Khan. Claim 39 depends from claim 25. Applicant respectfully traverses this rejection.

As noted previously, Baranzahi fails to teach or suggest "one or more catalytic gate-electrodes deposited on [a semiconductor] surface" and "one or more ohmic contacts deposited on [a semiconductor layer] surface" as recited in claim 25. Further, von Windheim fails to teach or suggest a gas sensor "selected from the group consisting of a HFET, a MISFET having a silicon nitride passivation layer, a MESFET, a MISHFET, a capacitor, a resistor, and a diode formed from layers of different dopings in a semiconductor device" as recited in claim 25. Further, since the focus of von Windheim is Schottky diodes, there would have been no motivation or suggestion to combine the teachings of von Windheim with Baranzahi. Khan is relied upon in the Office action as teaching the

use of a heterostructure AlGaN layer, and thus, provides no relevant teaching or suggestion to those of Baranzahi and von Windheim.

For at least the aforementioned reasons, applicant respectfully traverses the rejection of claims 1, 2, 5-26 and 29-51. Withdrawal of the rejections is respectfully requested, and allowance of the claims is respectfully solicited. Should the Examiner believe that anything further is needed to place the application in even better condition for allowance, the Examiner is requested to contact applicant's undersigned representative at the telephone number below.

Respectfully submitted,

By W. E. Powell

William Powell
Reg. No. 39,803
General Electric Company
Building K1, Room 3A68
Schenectady, New York 12301
Telephone: (518) 387-4530